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Publication date:
2010

Document version
Publisher's PDF, also known as Version of record

ISOPOL XVII

International Symposium on Problems of Listeriosis

Book of Abstracts

May 5 – 8th, 2010
Alfândega Congress Centre in Porto, Portugal

www.esb.ucp.pt/isopol2010

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REFERENCE A/P 23

Influence of sub-lethal concentrations of disinfectants on *Listeria monocytogenes* adhesion and invasion in Caco-2 cells

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Listeria monocytogenes is frequently detected in the food processing environment, where it, ideally, must be exposed to disinfectants daily. However, *L. monocytogenes* is not always eliminated by the disinfection process. One reason could be that the bacteria are only exposed to sub-lethal concentrations of the disinfectant. We have recently shown that sub-lethal concentrations of disinfectants used in the food industry affect virulence gene expression on transcript level in *L. monocytogenes,* and the effect depend on the active components of the disinfectants. The aim of the present study was to determine if disinfectants used routinely in the food industry affect the virulence of this pathogen studied in a cell-model. Two different disinfectants were used. Compound 1 contains peracetic acid and hydrogen peroxide as the active ingredients and reduces the expression of virulence genes in *L. monocytogenes* whereas Compound 2 contains quaternary ammonium compounds (QAC) and induces virulence gene expression. *L. monocytogenes* EGD was exposed to the two disinfectants for one hour in a non-inhibiting and a sub-lethal concentration, and subsequently the bacterial cells were added to a monolayer of Caco-2 cells. Bacterial adhesion and invasion were monitored. Exposure of *L. monocytogenes* to the sub-lethal concentration (0.0031%) of the QAC disinfectant significantly increased adhesion to Caco-2 cells as compared to bacteria exposed to water (control) and resulted in a slightly higher invasion. No effect was observed of the non-inhibiting concentration of the QAC disinfectant (0.0016%). In contrast, the adhesion was unaffected and the invasion slightly decreased after exposure to the non-inhibiting concentration of 0.125% of the peracetic disinfectant as compared to bacteria exposed to water. On-going studies will evaluate how long term exposure to disinfectants will affect adhesion and invasion to Caco-2 cells and these data will also be discussed.

REFERENCE A/P 24

The SOS response in *Listeria monocytogenes* – a stress survival mechanism

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The SOS response is a functionally conserved DNA repair system found in a variety of bacteria. The SOS response involves two central regulatory components, RecA and LexA, which coordinate the expression of target genes leading to arrest of cell division, DNA repair and mutagenesis. Historically, the SOS response is linked to the presence of single stranded DNA and stalled replication forks induced by UV radiation. However several other stress conditions, which are not expected to cause massive DNA damage, have been shown to induce SOS response e.g. mild heat treatment, antibiotics, ethanol and salt stress. The SOS response of the food borne pathogen *Listeria monocytogenes* is presently not well understood. We find it likely that the SOS response is important for the growth and survival of this pathogen in contaminated foods and during infection. It is therefore of great interest to investigate this response in *L. monocytogenes* into more details. To this end, we focused our studies on the auto regulated repressor protein LexA, the genes targeted by this regulator, and the environmental signals leading to activation of the SOS response in *L. monocytogenes*. LexA regulated gene expression is analyzed by comparing expression profiles of WT *L. monocytogenes* with Δ*lexA* and *lexA** strains expressing a non functional and a constitutive active LexA, respectively. In order to further elucidate the regulatory mechanisms and timing of the SOS response, we construct promoter-reporter gene fusions, which report the size and duration of activation of LexA controlled protein expression. As reporter genes we employ both *lacZ* and degradation tagged *gfp*. We thus expect to be able to monitor time resolved changes in SOS gene expression and thus come closer to the apparently versatile role of this stress response mechanism in *Listeria monocytogenes*.